

# CS 245: Assembly Language Programming

Fall 2018

Assembly Language introduces students to Computer Architecture in a way where students can SEE how things really happen in a computer. Assembly language is the interface between hardware and software, and introduces students to registers, memory, the processor, and computer math. Computer math is a useful skill that shows how computers actually process and store data.

**Instructor:** Susan J Lincke, Ph.D.

**Email:** lincke <at> uwp.edu

**Web Page:** [www.cs.uwp.edu/Classes/Cs245](http://www.cs.uwp.edu/Classes/Cs245)

**Office Hours:** Wed. 1-5, or by appointment

**Office Location:** MOLN 255

**Class Hours:** Sec. 001: TR 11-12:22 PM  
Sec. 002: TR 5-6:22 PM

**Class Location:** MOLN 318

**Text:** *Essentials of Computer Organization and Architecture*, Null & Labur (COA)  
*Introduction to MIPS Assembly Language* (accompanies text online) (MIPS)

**Prerequisites:** Prerequisite: CS 231 Discrete Math, Corequisite: CS 242 Computer Science II

## Course Outline:

1. Intro to Computer Math: Binary, Octal, Hexadecimal (COA Chapters 2-2.3, 2.6)
2. Intro to Assembly Language: Using registers, defining data/ASCII (MIPS Chapters 2-2.1, 3-3.2, 4-4.1)
3. Assembly Programming: Implementing logic (MIPS Chapter 4.2-4.4)
4. Assembler/Disassembler and assembly logic (MIPS Chapter 2.3-2.4)
5. Assembly Programming: Addressing modes (MIPS Chapter 2.5, 5-5.2)
6. Assembly Programming: Procedures (MIPS Chapter 2.2, 6-6.3)
7. Compilers, Assemblers, Linkers, Loaders (COA Chapter 8.4)
8. Computer Math: Signed integer arithmetic (COA Chapter 2.4)
9. Computer Math: Floating point arithmetic (COA Chapter 2.5)
10. Time permitting: Intro to Logic Design (COA Chapter 3-3.3)

**Homework Assignments:** There will be weekly quizzes and 4 assembly programming exercises.

**Due Dates:** Exam dates and homework due dates are posted on my web page. Quiz due dates are listed in Canvas.

## Grading:

- In-class lab/homework: 8%
- Four programming assignments @ 8% = 32% total
- Weekly quizzes in Canvas: 10%
- Two exams @ 25% each: 50% total

**Grading Scale:** A= 90%      B=80%      C=70%      D=60%      F<60%

Plus grades are assigned for grades within 2% of the next higher grade.

Minus grades are assigned for grades within 2% of the next lower grade.

**Academic Honesty:** Any indication of copying homework or any behavior during exams that could be considered copying or cheating will result in an immediate zero on the assignment or exam for all parties involved. In addition, the student's advisor/department will be notified. Cheating on assignments is defined to be copying from someone else or providing someone else copies of your answers. Do not show your assignments to anyone else! You may answer questions on labs or project homework asked by other students.

### **Undergraduate Learning Goals:**

This course develops the following UWP shared learning goals (in bold) and CS-major ABET learning outcomes (with alphabet bullets):

**Reasoned Judgment:** Critical thinking, ethical thinking, scientific thinking, *analytic skills*, aesthetic skills

(a) Apply knowledge of *computing* and *mathematics* appropriate to the discipline

(c) Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs

**Social & Personal Responsibility:** *Teamwork*, civic engagement, individual accountability, social equality, global perspective (*security*)

(d) An ability to function effectively on teams to accomplish a common goal

(e) An understanding of professional, ethical, legal, *security* and social issues and responsibilities

### **Course Regulations:**

**Weapons:** Weapons are prohibited in UW-Parkside buildings and all outdoor events. Anyone found in violation will be subject to immediate removal in addition to academic and/or legal sanctions.

**Exam Make-Ups:** Prior notice must be given to me when an exam must be missed. No make-up exams will be granted unless satisfactory documentation is produced to show an extenuating circumstance. Please see my web page for exam dates.

### **Homework Assignment Submission Policy and Guidelines**

Assignments are to be submitted in class on the date due. All assignments shall be submitted as hard copy, but program code must in addition be submitted electronically. Hard copies should be left on my table at the start of the class. Every assignment should be stapled together and have an id-box header as follows:

# Your Name

# CS 245 – Assembly Programming

# Assignment description

Assignments turned in late will automatically have one full grade deducted. No assignments will be accepted one week or later after the due date. Assignments submitted after the first 10 minutes of class will be counted as a day late. This policy is meant to discourage people from skipping class to finish a project. If a project is partially turned in (electronic or paper but not both) one half of a grade will be deducted.

**Food in Class:** Drinks are allowed in class. Food that is not loud and does not smell is allowed in class. Thus, for the benefit of your hungry neighbors, grilled food and potato chips are not allowed.

**Accommodation for Religious Observances:** UW-Parkside policy requires that reasonable accommodation for a student's religious beliefs. Please notify Dr. Lincke within the first two weeks of classes about any scheduled class date that conflicts with a religious observance.

**Students with a Disability:** The University has many resources available to assist students with their academic studies. Anyone who has special needs that must be accommodated to fulfill the course requirements should contact the Disability Services Coordinator in the Office of Educational Support Services (WLLC D175, 595-2372), and also keep me informed.